USE OF FOCUSED ULTRASOUND FOR VASCULAR SEALING

Abstract of the Disclosure

An ultrasonic applicator unit (2) is used diagnostically to locate a puncture wound (316) in an artery and then therapeutically to seal the puncture wound with high intensity focused ultrasound (HIFU). A control unit (6) coupled to the applicator unit includes a processor (74) that automates the procedure, controlling various parameters of the diagnostic and therapeutic modes, including the intensity and duration of the ultrasonic energy emitted by the applicator unit. A protective, sterile acoustic shell (4), which is intended to be used with a single patient and then discarded, is slipped over the applicator unit to protect against direct contact between the applicator unit and the patient and to maintain a sterile field at the site of the puncture. The apparatus and method are particularly applicable to sealing a puncture made when inserting a catheter into an artery or other vessel. Several different procedures are described for locating the puncture wound, including imaging the vessel in which the puncture is disposed and use of a locator rod to determine the disposition of the puncture along the longitudinal axis of the artery.